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Frehse, may be accounted for by the fact that they were made in higher latitudes; nor ought we to forget that the country of Nertchinsk is mountainous, and lies high.

Still further east, again, the perpetual ground ice is found at a less depth southwards, probably because the neighbourhood of the sea raises the temperature of the soil. Erman, at least, found no ice in the soil at Okhotzk.

It seems that Fort Churchill in America, in lat. 59° N., long. 94° W., lies exactly on the limit of perpetually frozen ice, as the mean temperature of this place is only a little below freezing point. (Signed) BAER.

## II.—*Astronomical Positions in European Turkey, Mount Caucasus, and Asia Minor, fixed* by F. G. W. STRUVE, from the Observations by Officers on the Imperial Russian Staff, in the years 1828 to 1832. Communicated by Captain H. G. HAMILTON, Royal Navy.

[The following important Table of Geographical Positions is extracted from the *Bulletin de l'Académie Impériale des Sciences de St. Petersbourg.*]

DURING the campaigns of the Russian armies in the last Turkish war in Europe and Asia, a series of astronomical and geographical observations was carried on, which were as important as they were remarkable for their extent and accuracy. On the appointment of the Director of the Dépôt of Maps belonging to the Imperial Staff (Lieutenant-General von Schubert), some officers were named to make astronomical observations at the points occupied by the armies, and were for this purpose supplied with a complete set of instruments. These observations were made in European Turkey, from 1828 to 1832, by Captains Vrontschenko, Ortenberg, and von Essen. They made use of two portable transit instruments, two astronomical theodolites, pendulums and chronometers, and telescopes for the observation of occultations, sextants, and a magnetic dipping-needle. In the further Caucasus and in Asia Minor, Captain Birdin worked with similar means, but without theodolites or a dipping-needle. On this side of Caucasus, and at some points of Turkey in Europe, the observations were made by officers of the Topographic corps. These observers had previously followed a complete course of practical astronomy at the Dorpat Observatory. From this circumstance, their labours became an object of peculiar interest to me; and I had much pleasure in undertaking the office of comparing their occultations and lunar culminations with corresponding observations—of deducing the longitudes from them, of revising the latitudes, and azimuth and chronometrical longitudes of the observers, and of bringing out the final results, particularly of the longitudes, by a comparison of what had been done by the several methods. For this purpose the original journals, as well as the calculations of the observers, were all brought to Dorpat. In making these various calculations, I had the assistance of the officers, both of the staff and of the fleet, who were residing there for their astronomical studies, as well as of some other young men attached to this pursuit. Besides, the astronomer Captain Lemm, of the Imperial Staff, had been ordered to Dorpat for nine months, as well to assist in the calculations as also to prepare the manuscript for the press. When this was completed, nothing remained for me to do but the comparison I have already alluded to, and the bringing out the results, which I took in hand a short time ago; and I have thus been able to bring to a conclusion, after several years' labour, the working up of these rich materials.

The result of this operation is the fixing astronomically of 89 points in Turkey in Europe, of 14 points in Caucasus and in Asia Minor, in addition to 6 positions on Ararat ascertained by Fedorov—making in all 109 points.

Of these points, the latitudes of 85 are determined by observations made with the astronomical theodolite; and these are correct, at least, to two seconds. The sextant was made use of for those in Servia, Caucasus, and Asia. In Servia also Captain von Essen observed with this instrument the altitudes of the stars. The agreement of the results by the northern and southern stars, generally α Aquilæ and the polar star, ensures the certainty of the latitudes within ten seconds. In Asia Minor, Captain Birdin found the latitudes by altitudes of the sun, with the exception of Erẓ-rúm, where he made use of the circle in the prime vertical, the results of which agree very well with that obtained from the altitudes of the sun. Fedorov determined with great accuracy the latitude of Tiflís with the theodolite, as well as that of one of the points on Mount Ararat, from whence the others were trigonometrically deduced.

It is well known that longitudes are much more difficult to fix than latitudes. It is only of late years that the right ascensions of the moon and of neighbouring stars have been applied for fixing longitudes correctly; and they were first used for geographical purposes by Preuss, in fixing the position of the harbour of St. Peter and St. Paul in Kamtchatka, and of St. Francesco in California, during the second voyage of Kotzebue round the world. This was prior to their application to the same end by Foster, when with Parry in Port Bowen. If the Russian navy may claim the honour of having first used this method, where it is much wanted—namely, in fixing positions at a distance from observatories—it has been much more extensively adopted by the officers of the Russian army: inasmuch as 22 longitudes, fixed in this way by lunar culminations, served as a basis for all the rest. Of these 22 longitudes, 16 belong to Turkey in Europe, and 6 to the other continent. Ten positions—that is, 7 in Europe and 3 in Asia —were also observed by occultations of stars. Finally, the longitudes of these positions, Várnah, Burgház, and Adrianople, were correctly fixed by a new method proposed by me—that is, by observing the zenith distances of the moon, and of a neighbouring fixed star. The advantage of this method is greater in proportion as the moon is nearer to the meridian. The coincidence of the longitude of Várnah, as found by this method with that derived from lunar culminations, as well as that of the longitudes of Burgház and Adrianople with those which Captain Manganari ascertained by the chronometer on some neighbouring points of the coast, from the observatory of Nicolaye, have proved the utility and the correctness of this method.

From the positions thus fixed, the longitudes of the remaining points have been ascertained, by the chronometer or by instantaneous lights, and by latitudes and azimuths. Besides single chronometric observations, five journeys (comprehending a greater extent of country) were also made with chronometers; among which journeys the most important was that which extended from Tchernetz, on the frontiers of Servia, upon the Danube, as far as Shurshhah, and thence northwards as far as Butushan in Moldavia. Five chronometers were used on this journey—(Barraud No. 542 and 810, Parkinson No. 542, Breguet No. 4160, Arnold No. 293).

The materials thus obtained for ascertaining the longitudes of places in European Turkey, between the Servian frontier and the Black Sea, have been so important, that, after a comparison between the mean longitudes and the various differences, a very remarkable degree of certainty has been obtained for all the results.

The following table contains all the longitudes, latitudes, and magnetic variations. In those longitudes which are marked with one asterisk there may be an error of something more than 10 seconds of time; in those with two asterisks, the error may be something more than 20 seconds of time. All the other longitudes must be correct within from 2 to 4 seconds of time:—

| No. | Name of the Place. | Locality. | Latitude, North. | Longitude East of Greenwich. | Variation. Date. | Variation. West. |
|---|---|---|---|---|---|---|
| | | BESSERABIA. | | | | |
| | | | ° ′ ″ | ° ′ ″ | | ° ′ |
| 1 | Ismá'íl | Sobor Cupola* | 45 20 29·6 | 28 47 49 | | |
| 2 | Tuchkovah | Church Tower | 45 20 35·6 | 28 49 29 | | |
| 3 | Sofiyání | Church Tower | 45 24 16·0 | 28 51 50 | | |
| 4 | Kíliyá | Sobor | 45 26 2·6 | 29 15 56 | 1828·77 | 8 53·2 |
| | | MOLDAVIA. | | | | |
| 5 | Yassi | Church of St. Charalampia | 47 10 24·1 | 27 34 43 | 1828·56 | 11 50·7 |
| 6 | Chitatsua Convt. | North Tower | 47 8 13·9 | 27 34 45 | | |
| 7 | Skuléni | Posthouse | 47 19 13·1 | 27 36 44 | | |
| 8 | Butushán | Church of St. Elias | 47 45 4·5 | 26 39 38 | 1831·24 | 9 43·5 |
| 9 | Rómano | Armenian Church | 46 55 21·8 | 26 55 19 | 1828·67 | 11 30·5 |
| 10 | Fokshán | Church of St. Spiridion | 46 13 49·7 | 27 54 17 | 1830·69 | 10 44·9 |
| 11 | Berlát | Church of St. John | 45 41 48·9 | 27 10 19 | 1829·30 | 11 19·0 |
| 12 | Galátz, or Galách | Uspenski Church | 45 26 12·3 | 28 2 56 | 1828·70 | 11 1·9 |
| | | WALLACHIA AND BULGARIA. | | | | |
| 13 | Ibräïl, or Bräïlov | Minaret of Láz-jámi' | 45 16 11·3 | 27 58 11 | 1828·72 | 10 43·1 |
| 14 | Ditto | Church of St. Michael | 45 16 19·8 | 27 58 10 | | |
| 15 | Buzeo | Ch. of the Banu Monastery | 45 9 1·4 | 26 48 52 | 1829·36 | 12 4·8 |
| 16 | Ditto | Church of Episcopia | 45 9 31·9 | 26 48 32 | | |
| 17 | Ployeshti | Uspenski Church | 44 56 20·7 | 26 16 9 | 1828·98 | 11 48·8 |
| 18 | Bucharest, or Bukuresti | Metropolitan Church | 44 25 39·0 | 26 35 23 | 1829·05 | 9 14·4 |
| 19 | Kalarash | Church | 44 11 29·2 | 27 19 24 | 1829·54 | 11 13·8 |
| 20 | Silisterah, or Silistria | Mesjid, *i.e.* Mosque | 44 7 9·8 | 27 14 41 | | |
| 21 | Shurshah | Church Tower of St. Nicholas in the Citadel | 43 53 14·7 | 25 57 33 | 1831·39 | 9 7·3 |
| 22 | Rushchúk | Tower | 43 50 36·8 | 25 56 40 | | |
| 23 | Zimnitza | Church of St. Constantine and Helena | 43 39 8·0 | 25 21 14 | 1831·40 | 10 15·2 |
| 24 | Sistovah | Mosque | 43 37 13·8 | 25 19 45 | | |
| 25 | Mogureni | Village | 43 44 39·1 | 24 52 9 | 1831·40 | 11 1·7 |
| 26 | Nicopolis, or Nígebólí | Eastern Mosque in the Fort | 43 42 18·1 | 24 53 19 | | |
| 27 | Kalafát | Village | 43 59 33·9 | 22 55 36 | 1831·65 | 11 42·8 |
| 28 | Viddín | Tower | 43 59 28·9 | 22 52 42 | | |
| 29 | Viddín | Mosque in the Citadel | 43 59 34·9 | 22 52 50 | | |
| 30 | Chernetz | St. Troitzki's Church | 44 38 3·9 | 22 42 6 | 1831·65 | 14 51·0 |
| 31 | Ditto | St. Peter's Church | 44 38 1·5 | 22 41 13 | | |
| 32 | Ditto | St. Nicolas' Church | 44 38 24·6 | 22 42 16 | | |
| 33 | Ditto | Lazaretto | 44 37 22·8 | 22 36 24 | | |
| 34 | Kladovah | Mosque | 44 36 53·1 | 22 35 57 | | |
| 35 | Tirgoshil | Bisserika Domneska Church Tower | 45 2 10·5 | 23 15 53 | | |
| 36 | Ditto | Delya-Kimp Church-Tower | 45 2 0·7 | 23 16 16 | | |
| 37 | Kráyovah | St. Anne's Church-Tower | 44 19 23·5 | 23 47 39 | | |
| 38 | Ditto | All Saints' Church-Tower | 44 19 8·4 | 23 47 43 | 1831·64 | 12 48·1 |
| 39 | Ditto | St. Nicolas' Church-Tower | 44 19 7·5 | 23 47 20 | | |
| 40 | Ditto | Tower of the Light-house | 44 19 7·6 | 23 47 10 | | |
| 41 | Slatina | St. Troitzki's Church-Tower | 44 25 55·8 | 24 20 56 | 1831·60 | 13 22·8 |
| 42 | Piteshti | St. Elias' Church-Tower | 44 51 4·8 | 24 52 4 | | |
| 43 | Ditto | Uspenski Church | 44 51 16·9 | 24 52 1 | | |
| 44 | Ditto | Tower of St. George's Church | 44 51 25·3 | 24 52 0 | 1831·58 | 12 47·0 |
| 45 | Tirgovist | Church Tower of St. George | 44 56 15·2 | 25 26 27 | | |
| 46 | Ditto | Ch. Tower of St. Demetrius | 44 56 6·2 | 25 26 35 | | |
| 47 | Ditto | Tower of the Metropolitan Ch. | 44 55 33·6 | 25 27 5 | 1831·57 | 12 48·4 |
| 48 | Ditto | Tower of the Mountain Convt. | 44 57 29·4 | 25 28 22 | | |
| 49 | Bábá-tágh | Minaret | 44 53 39·6 | 28 44 25 | 1828·82 | 12 9·8 |
| 50 | Hirshóvah | Mosque | 44 41 3·8 | 27 54 30 | 1828·94 | 11 48·8 |
| 51 | Chernovodi | Mosque | 44 20 23·2 | 28 0 26 | | |
| 52 | Zimíni-dindel | Centre of the Village | 44 22 27·3 | 28 0 50 | 1828·93 | 11 40·4 |
| 53 | Tarkutaï | Mosque | 44 3 35·5 | 26 36 35 | 1829·50 | 11 36·0 |

* The Cathedral.

| No. | Name of the Place. | Locality. | Latitude, North. | Longitude East of Greenwich. | Variation. | |
|---|---|---|---|---|---|---|
| | | | | | Date. | West. |
| | | WALLACHIA AND BULGARIA—CONTINUED. | | | | |
| | | | ° ′ ″ | ° ′ ″ | | ° ′ |
| 54 | Kustenje, or Chiastenza | Mosque . . . . . . . . | 44 10 21·2 | 28 42 2 | 1828·93 | 11 32·8 |
| 55 | Mankaliyá, or Mangalia | Mosque in the Market-place | 43 48 31·3 | 28 37 18 | 1830·48 | 12 13·1 |
| 56 | Bázárjik . . | Mosque in the Market-place | 43 34 16·8 | 27 54 3 | 1830·36 | 10 41·2 |
| 57 | Kávarnah, or Egerneh | N. W. Mosque . . . . . . | 43 25 49·8 | 28 22 50 | 1830·46 | 10 11·9 |
| 58 | Várnah . . . | Mosque of Ḥasan Baïrákdár | 43 12 3·3 | 27 57 33 | 1829·72 | 9 49 5 |
| 59 | Parávádí, or Pravódí | Mosque . . . . . . . | 43 10 30·4 | 27 28 7 | 1830·44 | 14 41·1 |
| 60 | Yeñí bázár . . | Mosque . . . . . . . . | 43 20 32·1 | 27 13 24 | 1830·36 | 11 6·2 |
| 61 | Shumlá . . . | Minaret . . . . . . . | 43 17 23·2 | 26 58 47 | | |
| 62 | Near Shumlá . | Point of Rock . . . . . . | 43 14 55·4 | 26 56 53 | | |
| | | BULGARIA AND ROUMELIA. | | | | |
| 63 | Slivno . . . | Mosque, called Hájí Ibráhím jámi'-sí . . . . . . . | 42 40 45·0 | 26 19 48 | | |
| 64 | Karínábád, or Carnabat | Mosque, called Hájí Ades jámi'-sí . . . . . . . | 42 38 57·6 | 27 1 13 | 1829·70 | 11 20·2 |
| 65 | Aïdós, (Aëtos) | Mosque, called Gornatá-jámí | 42 42 17·5 | 24 48 28 | 1829·70 | 11 32·3 |
| 66 | Misivrí (Mesembria) | Metropolitan Church . . | 42 39 44·9 | 27 47 28 | 1829·68 | 10 47·6 |
| 67 | Akhyólí (Anchialé) | Preobrazhenski Church . . | 42 33 25·05 | 27 42 21 | 1829·69 | 11 19·3 |
| 68 | Sozeh-bólí (Sozopolis) | Centre of the Hospital, on an insulated height in the City | 42 26 46·3 | 27 45 25 | | |
| 69 | Burgház (Pyrgos) | Chief Mosque in the Bázár . | 42 29 35·87 | 27 31 48 | 1829·70 | 11 5·4 |
| 70 | Yánbólí (Joannopolis) | Old Jámi' . . . . . . . | 42 29 6·3 | 26 33 31 | 1829·84 | 11 35·3 |
| 71 | Adrianople . . | Tower of the Eski-Saraï (old Seraglio) . . . . . | 41 41 26·5 | 26 35 41 | | |
| 72 | Kirk kilísá (40 Churches) | Mosque, called Mohammed Debender-jámi' . . . . | 41 43 58·8 | 27 12 38 | | |
| 73 | Vízah (Byzia) . | Mosque, formerly the Ch. of St. Nicolas . . . . | 41 34 26·9 | 27 45 28 | | |
| 74 | Saráï . . . | Mosque, called Ages Páshá-jámi' . . . . . . . | 41 26 27·0 | 27 56 23 | | |
| 75 | Chórlú . . . | Yení Jámí' (*i.e.* NewMosque) | 41 9 46·3 | 27 48 2 | | |
| 76 | Lúleh Burgház . | Principal Mosque . . . . | 41 24 25·1 | 27 21 21 | 1829·75 | 11 25·0 |
| 77 | Dímotíkah (Didymotichos) | Tower of the Castle . . . | 41 21 3·5 | 26 30 39 | 1829·74 | 11 41·4 |
| | | SERVIA. | | | | |
| 78 | Porech . . . | Island in the centre of the City . . . . . . . . | 44 30 36·3 | 22 2 51 | | |
| 79 | Gradeshti . . | End of the Great Road on the bank of the Danube . . | 44 45 53·8 | 21 29 37 | | |
| 80 | Smedreva . . | Stone Church in the suburb towards Belgrade . . . | 44 39 51·3 | 20 24 17 | | |
| 81 | Shabtza . . . | Suburb, not far from the new stone church . . . . | 44 45 22·1 | 19 41 58 | | |
| 82 | Belgrade . . | Vracha, Prince Milosh's country house, outside of the fortress, not from the river Tópchíder . . . . | 44 47 57·0 | 20 25 12* | | |
| 83 | Krakoevatz . | Centre of the City . . . | 44 0 29·4 | 20 55 32* | | |
| 84 | Karanovatz . | Soshestwi Church . . . | 43 43 26·2 | 20 39 17* | * | |
| 85 | Chachak . . | Near the Church of All Saints, now a mosque—stone-house with a cupola . . . . . | 43 53 29·7 | 20 21 7* | * | |
| 86 | Svoïdrug . . | Pot-house . . . . . . . | 44 2 15·3 | 19 16 45* | * | |
| 87 | Tupriyeh . . | Lazaretto . . . . . . . | 43 56 3·3 | 21 19 59* | * | |
| 88 | Poshegi . . . | Pot-house . . . . . . . | 43 50 49·6 | 19 46 44* | * | |
| 89 | Yassika . . . | Centre of the City . . . | 43 36 37·3 | 21 17 9* | * | |

| No. | Name of the Place. | Locality. | Latitude, North. | Longitude, East of Greenwich. | Variation. Date. | Variation. West. |
|---|---|---|---|---|---|---|
| | | CAUCASUS AND ASIA MINOR. | | | | |
| | | | ° ′ ″ | ° ′ ″ | | ′ ° |
| 1 | Tiflís | Height in the Governor's Garden | 41 41 4·0 | 44 50 39 | | |
| | | A place near it, south of the Catholic Church | 41 41 27·4 | | | |
| 2 | Piati-gorsk | Alexandrov's Spring | 44 2 39·3 | 43 5 8 | | |
| 3 | Kizlovodsk | Centre of the Fortress | 43 54 21·0 | | | |
| 4 | TzarskieKolodzi | . . . | 41 27 57·7 | | | |
| 5 | Jar, or Novaya Zakatali | . . . | 41 37 40·6 | | | |
| 6 | Nukhi | . . . | 41 11 46·3 | | | |
| 7 | Akháltzikeh | Second Gate of the Citadel | 41 39 4·7 | | | |
| 8 | Kárs | In the Fortress | 40 37 1·7 | 43 9 2 | | |
| 9 | Árdagán | Near the Fortress, the House of the old Caravanseraï | 41 7 15·9 | 42 48 24 | | |
| 10 | Gúmrí | Close to the Lazaretto Surgery | 40 46 57·6 | 43 46 54 | | |
| 11 | Hasan Ḳal'eh | . . . | 39 58 47·4 | | | |
| 12 | Erz-Rúm | . . . | 39 55 16·1 | 41 18 31 | | |
| 13 | Báïbúrt | . . . | 40 15 36·5 | 40 8 48 | | |
| 14 | Kalkit chiftlik | . . . | 40 8 2·6 | 39 10 23 | | |
| | | FEDEROW'S DETERMINATIONS ON ARARAT. | | | | |
| 15 | . . . | Point of Little Ararat | 39 39 10·68 | 44 24 34 | | |
| 16 | . . . | Foremost point of Great Ararat | 39 42 24·17 | 44 17 53 | | |
| 17 | . . . | Hindermost point of Ditto | 39 42 21·94 | 44 17 38 | | |
| 18 | . . . | Convent of St. Jacob | 39 46 12·10 | 44 21 52 | | |
| 19 | . . . | Village of Bajád | 39 52 38.78 | 44 31 5 | | |
| 20 | . . . | Point of the Hill of Alagetz | 40 31 35·65 | 44 11 23 | | |

## III.—*On the recent Russian Expeditions to Novaïa Zemlïa.* By Professor K. E. von Baer.

[Abridged from the *Bulletin de l'Académie Impériale de Sciences de St. Petersbourg.*]

[While our enterprising countrymen in the west are gradually prosecuting discovery on the northern shores of America within the arctic circle, it may not be uninteresting or uninstructive to turn our eyes to the east, and observe what our active rivals in the polar regions, the hardy Russians, are doing towards the improvement of the geography of the more northern lands that lie immediately adjacent to their own coasts;—and with this view, as also with the object of enriching our Journal with some valuable geographical information, an outline is subjoined of the recent expeditions to the islands of Novaïa Zemlïa, abridged from several communications made by Professor Baer, during the past year, to the Academy of Sciences at St. Petersburg, and accompanied by a chart showing the *actual* outline of its coasts, as traced by the